

## PATENT ABSTRACTS OF JAPAN

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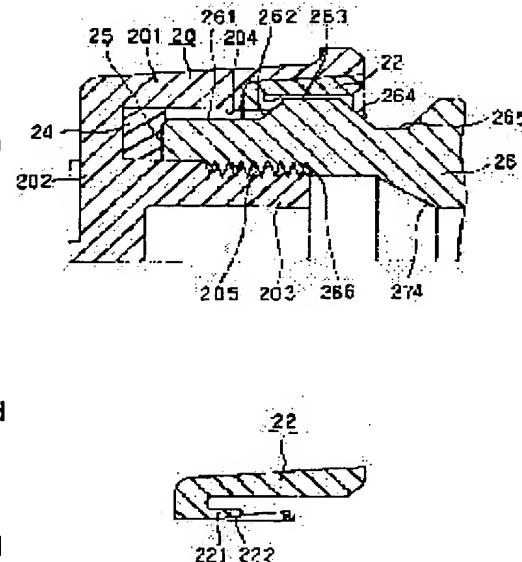
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## (54) PIPE END SEALER

## (57)Abstract:

PURPOSE: To prevent a sealing surface from corroding by bringing a lip part provided on a pipe end sealer for sealing the open end into contact with a large diameter part or a tapered portion formed on the pipe keeping water tightness to protect the sealing surface formed on a pipe outer surface.

CONSTITUTION: A resin cap 20 as a pipe end surface sealing tool, which prevents an end surface of a charge valve 26 serving to fill or recover a refrigerant in a freezing cycle, includes a body part 202 having an outer periphery 201 and an inner periphery 203 both provided to fit to an outer periphery and an inner periphery of the charge valve 26, and the inner periphery 203 is combined with the inner periphery of the charge valve 26 with a screw. On the inner periphery surface of the outer periphery 201 a U-shaped section lip part 22, which comprises an elastic material such as rubber, is provided integrally with the cap 20. A tip end 222 thereof contacts water-tightly with a tapered part 262 next to a large diameter part 263 of the valve 26. A rubber packing 24 is fitted to a space part bottom part between the inner and outer peripheries 201 and 203.



## LEGAL STATUS

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] It is formed in an anti-opening end-face side from the narrow diameter portion formed in an opening end-face side, and this narrow diameter portion. It is formed between the major-diameter section which has a larger outer diameter than the aforementioned narrow diameter portion, and the aforementioned narrow diameter portion and the major-diameter section. In the tube-end side closure implement which closes the opening end face of the pipe with which it has the taper section which the peripheral face of the aforementioned narrow diameter portion and the aforementioned major-diameter section is made to follow, and a sealing surface is formed in the aforementioned narrow diameter portion superficies. This closed-end cylindrical shape-like soma which has the end-face section which is prepared in the unilateral end face of the cylindrical shape-like 1st body, the 2nd body prepared in the periphery of this 1st body and the 1st body of the above, and the 2nd body, and opens both bodies for free passage. In the state where it fitted in towards the small outer-diameter section of the aforementioned bulb from the field side where it has the lip section prepared in the inner skin of the 2nd body of this aforementioned soma, and this aforementioned soma was opened wide this aforementioned soma. It is the tube-end side closure implement which fits in with the inner skin of the aforementioned bulb in the peripheral face of the 1st body, and is characterized by for the aforementioned lip section maintaining the taper section or the major-diameter section, and the watertight of the aforementioned pipe at least, and contacting.

[Claim 2] The aforementioned lip section is a tube-end side closure implement according to claim 1 which consists of elastic matter.

[Claim 3] The inner skin of the 2nd body of the aforementioned tube-end side closure implement is the claim 1 formed so that the radius from a center may become equally or large towards the field side wide opened from the end-face section side, or a tube-end side closure implement according to claim 2.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] Especially this invention uses that the end face of a service bulb which fills up with or collects [ be / under / refrigerating cycle / which forms a freezer ] receiving / it ] refrigerants corrodes about a tube-end side closure implement as a cap who protects and is effective.

#### [0002]

[Description of the Prior Art] Since it is filled up with a refrigerant into the refrigerating cycle used for the air conditioner for vehicles from the former, as shown in drawing 5, the charge bulb 26 is arranged in the piping 58 between the receivers 62 and expansion valves 64 which were prepared in the refrigerating cycle 57. In case it is filled up with a refrigerant in a refrigerating cycle 57, a socket 28 is inserted in the periphery of this charge bulb 26, and from this socket 28 side, a refrigerant is flowed into the interior of the charge bulb 26 side, and it is filled up with a refrigerant in the piping 30 of a refrigerating cycle.

[0003] As shown in drawing 3, when the ball 40 prepared in the socket 28 gets into the 2nd taper side 264 of the charge bulb 26, the charge bulb 26 and both the socket 28 are fixed.

Moreover, O ring 32 formed in the socket 28 at this time is carrying out airtight maintenance of the gap of the charge bulb 26 and a socket 28 by being close to the sealing surface 260 of the 1st smallness outer-diameter section 261 of the charge bulb 26.

[0004] After restoration of a refrigerant, a socket 28 is sampled, and as shown in drawing 7, the screw thread section 215 of the inner circumference section 213 prepared for the cap 21 is thrust into the screw section 266 in which it was prepared at the inner circumference side of the charge bulb 26, and it fixes. In order to make it a refrigerant not leak from between a cap's 21 screw thread section 215, and the screw sections 266 of a charge bulb bore, the rubber-like packing 24 is arranged.

#### [0005]

[Problem(s) to be Solved by the Invention] In the above-mentioned conventional cap, it can prevent a refrigerant leaking from the gap of the screw section 266 by the side of the inner circumference the charge bulb's 26, and a cap's 21 screw thread section 215 to the periphery side of the charge bulb 26 by arranging the rubber-like packing 24.

[0006] However, when fitting a socket 28 into the periphery of the charge bulb 26 since it is filled up with a refrigerant in a refrigerating cycle 57 as shown in drawing 3, as shown in drawing 6, the sealing surface 260 of the 1st smallness outer-diameter section 261 of the charge bulb 26 by which a seal is carried out to O ring 32 formed in the socket 28 has produced the crevice between a cap's 21 inner skin at the time of cap fitting of those other than the time of refrigerant restoration, and is open for free passage at it with the exterior.

[0007] A corrosion factor especially enters to this crevice in a salt damage area at the time of a usual run of vehicles, and there is a problem of making the sealing surface 260 of the 1st smallness outer-diameter section 261 corrode. When the sealing surface 260 corroded and fitting fixation of the socket 28 is carried out at the charge bulb 26 since it is filled up with a refrigerant in a refrigerating cycle 57, there is a possibility of becoming the cause by which it becomes

impossible to carry out the seal of the gap of O ring 32 and a sealing surface 260 enough, and a refrigerant leaks outside.

[0008] Then, this invention aims at offering the cap who can prevent the sealing surface of a socket and the bulb which fits in corroding.

[0009]

[Means for Solving the Problem] The narrow diameter portion formed in an opening end-face side in order that this invention may attain the above-mentioned purpose, The major-diameter section which is formed in an anti-opening end-face side, and has a larger outer diameter than the aforementioned narrow diameter portion from this narrow diameter portion, And it is formed between the aforementioned narrow diameter portion and the major-diameter section, have the taper section which the peripheral face of the aforementioned narrow diameter portion and the aforementioned major-diameter section is made to follow, and it sets to the tube-end side closure implement which closes the opening end face of the pipe with which a sealing surface is formed in the aforementioned narrow diameter portion superficies. This closed-end cylindrical shape-like soma which has the end-face section which is prepared in the unilateral end face of the cylindrical shape-like 1st body, the 2nd body prepared in the periphery of this 1st body and the 1st body of the above, and the 2nd body, and opens both bodies for free passage, In the state where it fitted in towards the small outer-diameter section of the aforementioned bulb from the field side where it has the lip section prepared in the inner skin of the 2nd body of this aforementioned soma, and this aforementioned soma was opened wide this aforementioned soma It fits in with the inner skin of the aforementioned bulb in the peripheral face of the 1st body, and the tube-end side closure implement characterized by maintaining the taper section or the major-diameter section, and the watertight of the aforementioned pipe at least, and contacting is used for the aforementioned lip section.

[0010] In addition, the aforementioned lip section adopts the tube-end side closure implement which consists of elastic matter as a desirable mode.

[0011]

[Function] In order to protect the sealing surface formed in the narrow diameter portion superficies of a pipe according to the cap of this invention which consists of the above-mentioned composition, the lip section prepared in the tube-end side closure implement which closes the opening end face of a pipe considers as the composition at which a watertight is maintained and which is contacted in the taper section or the major-diameter section formed in the pipe.

[0012] If the lip section and a pipe maintain a watertight and it is in contact in the taper section or the major-diameter section formed in the pipe in order that a tube-end side closure implement may fit in from the narrow diameter portion side formed in the opening end face of a pipe, the narrow diameter portion of the pipe currently formed in the inside will be intercepted with the exterior. Therefore, it is lost that a corrosion factor enters from the exterior.

[0013] Moreover, by using the elastic matter for the lip section, the adhesion of the lip section and a bulb becomes much more good, and it can prevent a corrosion factor entering from the exterior much more effectively.

[0014]

[Example] The 1st example which used the cap of the charge bulb of this invention for below is explained with a drawing.

[0015] Drawing 1 is a half-section view when fitting the cap 20 of the charge bulb of the 1st example of this invention into the charge bulb 26. Drawing 2 is the cross section of the lip section 22 prepared for the cap 20, and drawing 3 is a half-section view when fitting in the charge bulb 20 and a socket 28.

[0016] As shown in the cross section of drawing 1, a cap 20 consists of the periphery section 201 prepared so that it might fit into the periphery side of the charge bulb 26, the inner circumference section 203 prepared so that it might fit into the inner circumference side of the charge bulb 26, and this soma 202 which connected the periphery section 201 and the inner circumference section 203, and was prepared in the direction of an outlet side of the charge bulb 26. Moreover, this cap 20 is formed from a resin.

[0017] The screw thread section 205 is formed in a cap's 20 inner circumference section 203, and this screw thread section 205 is thrust into the screw section 266 prepared in the inner circumference side of the charge bulb 26.

[0018] The lip section 22 formed from elastic bodies, such as an elastomer or rubber material, is formed in the inner skin of the periphery section 201, and this lip section 22 and cap 20 are really fabricated.

[0019] In addition, since the elastomer has the middle property of a resin and rubber, although its affinity with a resin is good and its adsorptivity of each other is good, affinity of rubber with a resin is bad and its mutual adsorptivity is not good.

[0020] As shown in drawing 2, the lip section 22 of this example presents cross-section the configuration of U characters, and to a cap's 20 direction of a center line, the inner circumference side 222 of the inner circumference flank 221 of this lip section 22 gives the angle of alpha, and is formed.

[0021] Moreover, the rubber-like packing 24 is formed in the space formed in a cap's 20 periphery section 201, this soma 202, and the inner circumference section 203. The point of the charge bulb 26 forms the 2nd narrow diameter portion 265 where the radius from a center to a peripheral face is small as well as the 1st narrow diameter portion 261 where the radius from a center to [ from the nose-of-cam 25 side ] a peripheral face is small, the 1st major-diameter section 263 with the large radius from a center to a peripheral face, and the 1st narrow diameter portion 261. The configuration equipped with the 1st taper section 262 which connects the 1st narrow diameter portion 261 and the 1st major-diameter section 263, and the 2nd taper section 264 which connects the 1st major-diameter section 263 and the 2nd narrow diameter portion 265 is presented. The configuration of the point of this charge bulb 26 is a configuration based on the Japan Refrigeration and Air Conditioning Industry Association standard (JRA specification).

[0022] Moreover, as this charge bulb 26 is shown in drawing 3 The 2nd major-diameter section 267 whose radius from a center to a peripheral face is the same path as the 1st major-diameter section 263, and the radius from a center the connection section 269 and the 2nd narrow diameter portion 265 in which the 3rd small narrow diameter portion [ of 268 or T characters ]-like free passage hole 271 was formed inside, and the 2nd major-diameter section 267 It has the 3rd taper section 272 open for free passage and the 4th tapér section 273 which opens the 2nd major-diameter section 267 and the 3rd narrow diameter portion 268 for free passage.

[0023] A cap's 20 screw thread section 205 and the screw section 266 screwed are formed in the inner skin 274 of this charge bulb 26, and the hole 275 of a cross-section circle configuration is formed from this screw section 266 to the free passage hole 271.

[0024] Moreover, the MUSHI section 50 equipped with O ring 56 which seals between the fixed part 54 prepared in the hole 275 inside the charge bulb 26 so that it might join to the inner skin 274 of the charge bulb 26, the move section 52 which it is arranged in the direction of a hole 275 possible [ movement ], and is joined to a fixed part 54, this move section 52 and the rod part 51 prepared in one, and the inner skin 274 of the charge bulb 26 and fixed parts 54 is formed. When the socket 28 is not connected, it has composition which the gap of a fixed part 54 and the move section 52 closes.

[0025] This charge bulb 26 is formed in the refrigerant piping 58 for which a refrigerant flows in the refrigerating cycle 57 which forms an air conditioner, as shown in drawing 5. In a receiver and 64, an expansion valve and 66 show an evaporator and 68 shows [ 60 / a capacitor and 62 ] a compressor. In the case of the example of illustration, the charge bulb 26 for pouring of a refrigerant and eccrisis is formed between a receiver 62 and the low-tension side of an expansion valve 64. As the dashed line showed, the charge bulb 26 may be formed between an evaporator 66 and the low-tension sides of a compressor 68, and in the high-tension side of a compressor 68.

[0026] On the other hand, in case a socket 28 is filled up with a refrigerant in a refrigerating cycle 57, it is equipment connected with the charge bulb 26. If a socket 28 is connected with the charge bulb 26, the cylindrical valve body 48 pushes the rod part 51 of the MUSHI section 50, and changes with the composition which makes the gap of a fixed part 54 and the move section

52. Moreover, the charge bulb 26 and a socket 28 connect and are fixed because the ball 40 prepared in the socket 28 fits into the 2nd taper section 264 of the charge bulb 26. At the time of connection to the charge bulb 26 and a socket 28, a gap with the 1st narrow diameter portion 261 of the charge bulb 26 is stuck with O ring 32 for seals formed in the socket 28. It consists of that the gap of the charge bulb 26 and a socket 28 is stuck by this O ring 32 so that the refrigerant which flows into the charge bulb 26 side may not leak from a socket 28 side to the gap shell exterior of a socket 28 and the charge bulb 26.

[0027] In addition, by attaching an angle alpha to the point 221 of the lip section 22, it is hard to involve in a point 221 between the 1st taper sections 262 of the charge bulb 26 in the direction of inner circumference, and it is smoothly pressed in the outer-diameter direction. It is that a point 221 is pressed in the outer-diameter direction, and presses the lip section 22 in the direction of inner circumference by the repulsive force, and the 1st taper side 262 and cap 20 of the charge bulb 26 are stuck certainly.

[0028] That is, if the cap 20 who shows drawing 1 like this composition in addition to the time of refrigerant restoration is used, it can prevent corrosion factors, such as water and a salt, flowing into the sealing surface 260 of O ring 32 arranged so that a refrigerant might not leak at the time of restoration of the refrigerant with which the inner circumference flank 222 of the lip section 22 stuck to the 1st taper section 262 of the charge bulb 26, therefore connected the socket, and the 1st narrow diameter portion 261 to stick.

[0029] When the sealing surface 260 of the 1st narrow diameter portion 261 corrodes, at the time of connection to a socket 28, the adhesion by O ring 32 becomes bad, and there is a possibility that a refrigerant may leak. However, if it does not enter, but a corrosion factor can prevent corroding to the sealing surface 260 of the 1st narrow diameter portion 261 and spreads it on it with constituting like this example, it can prevent a refrigerant leaking.

[0030] In addition, the above-mentioned MUSHI section 50 is built in the interior, and these charge bulbs 26 are usually in a stoppage state. If a socket 28 is inserted in the charge bulb 26 and it fixes to it, the MUSHI section 50 is opened wide, and a refrigerant will flow the inside of the hose 70 arranged on the socket 28, and will be led to the refrigerant reclaimer 72.

[0031] Next, as shown in drawing 4, other examples of the lip section are explained. With a U character-like lip, as shown in drawing 4 (a), if the lip section 74 which formed the semi-sphere section 741 of a semi-sphere configuration at the nose of cam is used for the cap 20 who shows drawing 1, since the semi-sphere section 741 is attached at the nose of cam, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0032] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (b), it is the lip section 76 of a L character configuration, and a point 761 is the V character configuration aslant omitted from both sides. If this lip section 76 is used for the cap 20 who shows drawing 1, in order to make a point 761 into a V character configuration, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0033] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (c), a point 781 presents the configuration omitted aslant in the lip section 78 of a L character configuration. Even if it uses this lip section 78 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 by the point 781 cut aslant is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0034] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (d), a point 801 is formed in the shape of a globular form in the lip section 80 of a L character configuration. Even if it uses this lip section 80 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0035] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (e), a half-triangle is formed in a point 821 in

the lip section 82 of a U character configuration. Even if it uses this lip section 82 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0036] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (f), a triangle is formed in a point 841 in the lip section 84 of a U character configuration. Even if it uses this lip section 82 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0037] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (g), you may form a point 861 thickly in the lip section 86 of a L character configuration. In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26.

[0038] As shown in drawing 6, it is good also as composition which forms the lip section 90 so that the inner circumference side of a cap's 23 periphery section 231 and this soma 232 may be met. At this time, the packing 24 shown in the 1st example becomes unnecessary, and the effect of the packing 24 of the 1st example and the effect of the lip section 22 can be acquired only by this lip section 90.

[0039] In addition, since affinity with the cap 23 formed from a resin is not good in case this lip section 90 is formed from rubber, the section 234 is formed stop escaping to the side of which the lip section 90 slips out so that the lip section 90 may not fall out. Fabrication becomes really possible by this thing [ making the radius from the center of the section 234 into the inner circumference side 91 and the diameter of said of the lip section 90 ] stop escaping.

[0040]

[Effect of the Invention] In order to protect the sealing surface which was described above and which is formed in the narrow diameter portion superficies of a pipe like according to the tube-end side closure implement of this invention, the narrow diameter portion of a pipe is intercepted with the exterior because the lip section of a tube-end side closure implement maintains the taper section or the major-diameter section, and the watertight of a pipe and contacts. Therefore, it can prevent that it is lost that a corrosion factor enters and the small outer-diameter section corrodes from the exterior.

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**TECHNICAL FIELD**

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**[Industrial Application]** Especially this invention uses that the end face of a service bulb which fills up with or collects [ be / under / refrigerating cycle / which forms a freezer ] receiving / it ] refrigerants corrodes about a tube-end side closure implement as a cap who protects and is effective.

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**PRIOR ART**

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[Description of the Prior Art] Since it is filled up with a refrigerant into the refrigerating cycle used for the air conditioner for vehicles from the former, as shown in drawing 5, the charge bulb 26 is arranged in the piping 58 between the receivers 62 and expansion valves 64 which were prepared in the refrigerating cycle 57. In case it is filled up with a refrigerant in a refrigerating cycle 57, a socket 28 is inserted in the periphery of this charge bulb 26, and from this socket 28 side, a refrigerant is flowed into the interior of the charge bulb 26 side, and it is filled up with a refrigerant in the piping 30 of a refrigerating cycle.

[0003] As shown in drawing 3, when the ball 40 prepared in the socket 28 gets into the 2nd taper side 264 of the charge bulb 26, the charge bulb 26 and both the socket 28 are fixed.

Moreover, O ring 32 formed in the socket 28 at this time is carrying out airtight maintenance of the gap of the charge bulb 26 and a socket 28 by being close to the sealing surface 260 of the 1st smallness outer-diameter section 261 of the charge bulb 26.

[0004] After restoration of a refrigerant, a socket 28 is sampled, and as shown in drawing 7, the screw thread section 215 of the inner circumference section 213 prepared for the cap 21 is thrust into the screw section 266 in which it was prepared at the inner circumference side of the charge bulb 26, and it fixes. In order to make it a refrigerant not leak from between a cap's 21 screw thread section 215, and the screw sections 266 of a charge bulb bore, the rubber-like packing 24 is arranged.

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**EFFECT OF THE INVENTION**

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**[Effect of the Invention]** In order to protect the sealing surface which was described above and which is formed in the narrow diameter portion external surface of a pipe like according to the tube-end side closure implement of this invention, the narrow diameter portion of a pipe is intercepted with the exterior because the lip section of a tube-end side closure implement maintains the taper section or the major-diameter section, and the watertight of a pipe and contacts. Therefore, it can prevent that it is lost that a corrosion factor enters and the small outer-diameter section corrodes from the exterior.

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**TECHNICAL PROBLEM**

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[Problem(s) to be Solved by the Invention] In the above-mentioned conventional cap, it can prevent a refrigerant leaking from the gap of the screw section 266 by the side of the inner circumference the charge bulb's 26, and a cap's 21 screw thread section 215 to the periphery side of the charge bulb 26 by arranging the rubber-like packing 24.

[0006] However, when fitting a socket 28 into the periphery of the charge bulb 26 since it is filled up with a refrigerant in a refrigerating cycle 57 as shown in drawing 3, as shown in drawing 6, the sealing surface 260 of the 1st smallness outer-diameter section 261 of the charge bulb 26 by which a seal is carried out to O ring 32 formed in the socket 28 has produced the crevice between a cap's 21 inner skin at the time of cap fitting of those other than the time of refrigerant restoration, and is open for free passage at it with the exterior.

[0007] A corrosion factor especially enters to this crevice in a salt damage area at the time of a usual run of vehicles, and there is a problem of making the sealing surface 260 of the 1st smallness outer-diameter section 261 corrode. When the sealing surface 260 corroded and fitting fixation of the socket 28 is carried out at the charge bulb 26 since it is filled up with a refrigerant in a refrigerating cycle 57, there is a possibility of becoming the cause by which it becomes impossible to carry out the seal of the gap of O ring 32 and a sealing surface 260 enough, and a refrigerant leaks outside.

[0008] Then, this invention aims at offering the cap who can prevent the sealing surface of a socket and the bulb which fits in corroding.

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**MEANS**

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[Means for Solving the Problem] In order that this invention may attain the above-mentioned purpose It is formed in an anti-opening end-face side from the narrow diameter portion formed in an opening end-face side, and this narrow diameter portion. It is formed between the major-diameter section which has a larger outer diameter than the aforementioned narrow diameter portion, and the aforementioned narrow diameter portion and the major-diameter section. In the tube-end side closure implement which closes the opening end face of the pipe with which it has the taper section which the peripheral face of the aforementioned narrow diameter portion and the aforementioned major-diameter section is made to follow, and a sealing surface is formed in the aforementioned narrow diameter portion superficies This closed-end cylindrical shape-like soma which has the end-face section which is prepared in the unilateral end face of the cylindrical shape-like 1st body, the 2nd body prepared in the periphery of this 1st body and the 1st body of the above, and the 2nd body, and opens both bodies for free passage, In the state where it fitted in towards the small outer-diameter section of the aforementioned bulb from the field side where it has the lip section prepared in the inner skin of the 2nd body of this aforementioned soma, and this aforementioned soma was opened wide this aforementioned soma It fits in with the inner skin of the aforementioned bulb in the peripheral face of the 1st body, and the tube-end side closure implement characterized by maintaining the taper section or the major-diameter section, and the watertight of the aforementioned pipe at least, and contacting is used for the aforementioned lip section.

[0010] In addition, the aforementioned lip section adopts the tube-end side closure implement which consists of elastic matter as a desirable mode.

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**OPERATION**

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[Function] In order to protect the sealing surface formed in the narrow diameter portion superfcies of a pipe according to the cap of this invention which consists of the above-mentioned composition, the lip section prepared in the tube-end side closure implement which closes the opening end face of a pipe considers as the composition at which a watertight is maintained and which is contacted in the taper section or the major-diameter section formed in the pipe.

[0012] If the lip section and a pipe maintain a watertight and it is in contact in the taper section or the major-diameter section formed in the pipe in order that a tube-end side closure implement may fit in from the narrow diameter portion side formed in the opening end face of a pipe, the narrow diameter portion of the pipe currently formed in the inside will be intercepted with the exterior. Therefore, it is lost that a corrosion factor enters from the exterior.

[0013] Moreover, by using the elastic matter for the lip section, the adhesion of the lip section and a bulb becomes much more good, and it can prevent a corrosion factor entering from the exterior much more effectively.

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## EXAMPLE

[Example] The 1st example which used the cap of the charge bulb of this invention for below is explained with a drawing.

[0015] Drawing 1 is a half-section view when fitting the cap 20 of the charge bulb of the 1st example of this invention into the charge bulb 26. Drawing 2 is the cross section of the lip section 22 prepared for the cap 20, and drawing 3 is a half-section view when fitting in the charge bulb 20 and a socket 28.

[0016] As shown in the cross section of drawing 1, a cap 20 consists of the periphery section 201 prepared so that it might fit into the periphery side of the charge bulb 26, the inner circumference section 203 prepared so that it might fit into the inner circumference side of the charge bulb 26, and this soma 202 which connected the periphery section 201 and the inner circumference section 203, and was prepared in the direction of an outlet side of the charge bulb 26. Moreover, this cap 20 is formed from a resin.

[0017] The screw thread section 205 is formed in a cap's 20 inner circumference section 203, and this screw thread section 205 is thrust into the screw section 266 prepared in the inner circumference side of the charge bulb 26.

[0018] The lip section 22 formed from elastic bodies, such as an elastomer or rubber material, is formed in the inner skin of the periphery section 201, and this lip section 22 and cap 20 are really fabricated.

[0019] In addition, since the elastomer has the middle property of a resin and rubber, although its affinity with a resin is good and its adsorptivity of each other is good, affinity of rubber with a resin is bad and its mutual adsorptivity is not good.

[0020] As shown in drawing 2, the lip section 22 of this example presents cross-section the configuration of U characters, and to a cap's 20 direction of a center line, the inner circumference side 222 of the inner circumference flank 221 of this lip section 22 gives the angle of alpha, and is formed.

[0021] Moreover, the rubber-like packing 24 is formed in the space formed in a cap's 20 periphery section 201, this soma 202, and the inner circumference section 203. The point of the charge bulb 26 forms the 2nd narrow diameter portion 265 where the radius from a center to a peripheral face is small as well as the 1st narrow diameter portion 261 where the radius from a center to [ from the nose-of-cam 25 side ] a peripheral face is small, the 1st major-diameter section 263 with the large radius from a center to a peripheral face, and the 1st narrow diameter portion 261. The configuration equipped with the 1st taper section 262 which connects the 1st narrow diameter portion 261 and the 1st major-diameter section 263, and the 2nd taper section 264 which connects the 1st major-diameter section 263 and the 2nd narrow diameter portion 265 is presented. The configuration of the point of this charge bulb 26 is a configuration based on the Japan Refrigeration and Air Conditioning Industry Association standard (JRA specification).

[0022] Moreover, as this charge bulb 26 is shown in drawing 3 The 2nd major-diameter section 267 whose radius from a center to a peripheral face is the same path as the 1st major-diameter section 263, and the radius from a center the connection section 269 and the 2nd narrow diameter portion 265 in which the 3rd small narrow diameter portion [ of 268 or T characters ]-

like free passage hole 271 was formed inside, and the 2nd major-diameter section 267 It has the 3rd taper section 272 open for free passage and the 4th taper section 273 which opens the 2nd major-diameter section 267 and the 3rd narrow diameter portion 268 for free passage.

[0023] A cap's 20 screw thread section 205 and the screw section 266 screwed are formed in the inner skin 274 of this charge bulb 26, and the hole 275 of a cross-section circle configuration is formed from this screw section 266 to the free passage hole 271.

[0024] Moreover, the MUSHI section 50 equipped with O ring 56 which seals between the fixed part 54 prepared in the hole 275 inside the charge bulb 26 so that it might join to the inner skin 274 of the charge bulb 26, the move section 52 which it is arranged in the direction of a hole 275 possible [ movement ], and is joined to a fixed part 54, this move section 52 and the rod part 51 prepared in one, and the inner skin 274 of the charge bulb 26 and fixed parts 54 is formed. When the socket 28 is not connected, it has composition which the gap of a fixed part 54 and the move section 52 closes.

[0025] This charge bulb 26 is formed in the refrigerant piping 58 for which a refrigerant flows in the refrigerating cycle 57 which forms an air conditioner, as shown in drawing 5. In a receiver and 64, an expansion valve and 66 show an evaporator and 68 shows [ 60 / a capacitor and 62 ] a compressor. In the case of the example of illustration, the charge bulb 26 for pouring of a refrigerant and eccrisis is formed between a receiver 62 and the low-tension side of an expansion valve 64. As the dashed line showed, the charge bulb 26 may be formed between an evaporator 66 and the low-tension sides of a compressor 68, and in the high-tension side of a compressor 68.

[0026] On the other hand, in case a socket 28 is filled up with a refrigerant in a refrigerating cycle 57, it is equipment connected with the charge bulb 26. If a socket 28 is connected with the charge bulb 26, the cylindrical valve body 48 pushes the rod part 51 of the MUSHI section 50 <TXF FR=0001 HE=250 WI=080 LX=0200 LY=0300>, and changes with the composition which makes the gap of a fixed part 54 and the move section 52. Moreover, the charge bulb 26 and a socket 28 connect and are fixed because the ball 40 prepared in the socket 28 fits into the 2nd taper section 264 of the charge bulb 26. At the time of connection to the charge bulb 26 and a socket 28, a gap with the 1st narrow diameter portion 261 of the charge bulb 26 is stuck with O ring 32 for seals formed in the socket 28. It consists of that the gap of the charge bulb 26 and a socket 28 is stuck by this O ring 32 so that the refrigerant which flows into the charge bulb 26 side may not leak from a socket 28 side to the gap shell exterior of a socket 28 and the charge bulb 26.

[0027] In addition, by attaching an angle alpha to the point 221 of the lip section 22, it is hard to involve in a point 221 between the 1st taper sections 262 of the charge bulb 26 in the direction of inner circumference, and it is smoothly pressed in the outer-diameter direction. It is that a point 221 is pressed in the outer-diameter direction, and presses the lip section 22 in the direction of inner circumference by the repulsive force, and the 1st taper side 262 and cap 20 of the charge bulb 26 are stuck certainly.

[0028] That is, if the cap 20 who shows drawing 1 like this composition in addition to the time of refrigerant restoration is used, it can prevent corrosion factors, such as water and a salt, flowing into the sealing surface 260 of O ring 32 arranged so that a refrigerant might not leak at the time of restoration of the refrigerant with which the inner circumference flank 222 of the lip section 22 stuck to the 1st taper section 262 of the charge bulb 26, therefore connected the socket, and the 1st narrow diameter portion 261 to stick.

[0029] When the sealing surface 260 of the 1st narrow diameter portion 261 corrodes, at the time of connection to a socket 28, the adhesion by O ring 32 becomes bad, and there is a possibility that a refrigerant may leak. However, if it does not enter, but a corrosion factor can prevent corroding to the sealing surface 260 of the 1st narrow diameter portion 261 and spreads it on it with constituting like this example, it can prevent a refrigerant leaking.

[0030] In addition, the above-mentioned MUSHI section 50 is built in the interior, and these charge bulbs 26 are usually in a stoppage state. If a socket 28 is inserted in the charge bulb 26 and it fixes to it, the MUSHI section 50 is opened wide, and a refrigerant will flow the inside of the hose 70 arranged on the socket 28, and will be led to the refrigerant reclaimer 72.

[0031] Next, as shown in drawing 4, other examples of the lip section are explained. With a U character-like lip, as shown in drawing 4 (a), if the lip section 74 which formed the semi-sphere section 741 of a semi-sphere configuration at the nose of cam is used for the cap 20 who shows drawing 1, since the semi-sphere section 741 is attached at the nose of cam, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0032] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (b), it is the lip section 76 of a L character configuration, and a point 761 is the V character configuration aslant omitted from both sides. If this lip section 76 is used for the cap 20 who shows drawing 1, in order to make a point 761 into a V character configuration, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0033] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (c), a point 781 presents the configuration omitted aslant in the lip section 78 of a L character configuration. Even if it uses this lip section 78 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 by the point 781 cut aslant is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0034] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (d), a point 801 is formed in the shape of a globular form in the lip section 80 of a L character configuration. Even if it uses this lip section 80 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0035] In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26. As shown in drawing 4 (e), a half-triangle is formed in a point 821 in the lip section 82 of a U character configuration. Even if it uses this lip section 82 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0036] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (f), a triangle is formed in a point 841 in the lip section 84 of a U character configuration. Even if it uses this lip section 82 for the cap 20 who shows drawing 1, adhesion with the 1st taper section of the charge bulb 26 is good, and does not involve in a nose of cam at the time of fitting with a cap 20 and the charge bulb 26.

[0037] In addition, in this configuration, a point 741 sticks with the 1st taper section 262 of the charge bulb 26. As shown in drawing 4 (g), you may form a point 861 thickly in the lip section 86 of a L character configuration. In addition, in this configuration, a point 761 sticks with the 1st major-diameter section 263 of the charge bulb 26.

[0038] As shown in drawing 6, it is good also as composition which forms the lip section 90 so that the inner circumference side of a cap's 23 periphery section 231 and this soma 232 may be met. At this time, the packing 24 shown in the 1st example becomes unnecessary, and the effect of the packing 24 of the 1st example and the effect of the lip section 22 can be acquired only by this lip section 90.

[0039] In addition, since affinity with the cap 23 formed from a resin is not good in case this lip section 90 is formed from rubber, the section 234 is formed stop escaping to the side of which the lip section 90 slips out so that the lip section 90 may not fall out. Fabrication becomes really possible by this thing [ making the radius from the center of the section 234 into the inner circumference side 91 and the diameter of said of the lip section 90 ] stop escaping.

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[Translation done.]

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1] It is the half-section view showing one example when fitting in the charge bulb and cap of this invention.

[Drawing 2] It is the half-section view showing one example of the lip section used for the cap of this invention.

[Drawing 3] It is a half-section view when fitting in a charge bulb and a socket.

[Drawing 4] (a), (b), (c), (d), (e), (f), and (g) are the half-section views showing the example of the lip section used for a cap, respectively.

[Drawing 5] It is the schematic diagram showing the connection place which used the charge bulb for the refrigerating cycle of an air conditioner.

[Drawing 6] It is the half-section view showing one example when fitting in the charge bulb and cap of this invention.

[Drawing 7] It is an important section cross section when fitting in a conventional charge bulb and a conventional cap.

**[Description of Notations]**

20 Cap

22 Lip Section

24 Packing

26 Charge Bulb

261 1st Narrow Diameter Portion

262 1st Taper Section

263 1st Major-Diameter Section

28 Socket

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**[Translation done.]**

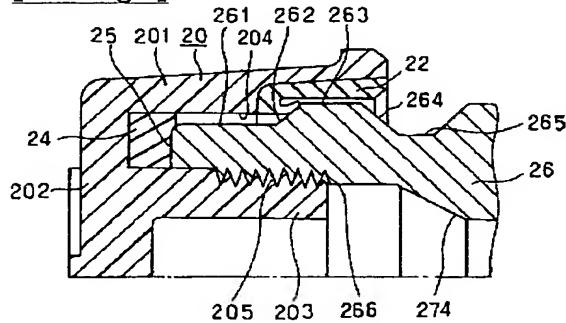
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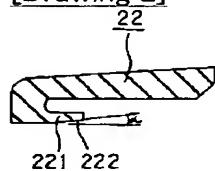
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## DRAWINGS

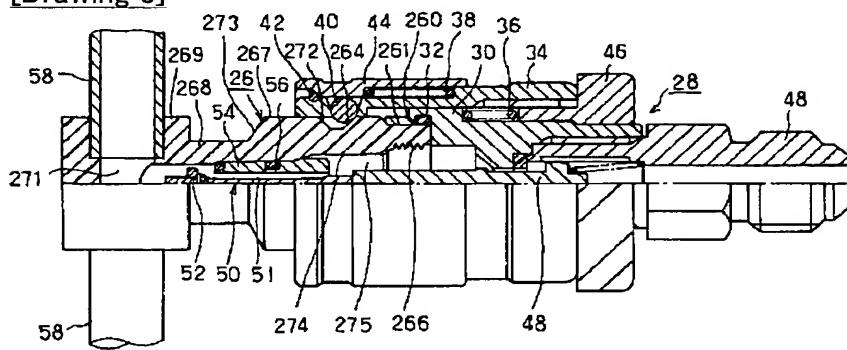
## [Drawing 1]



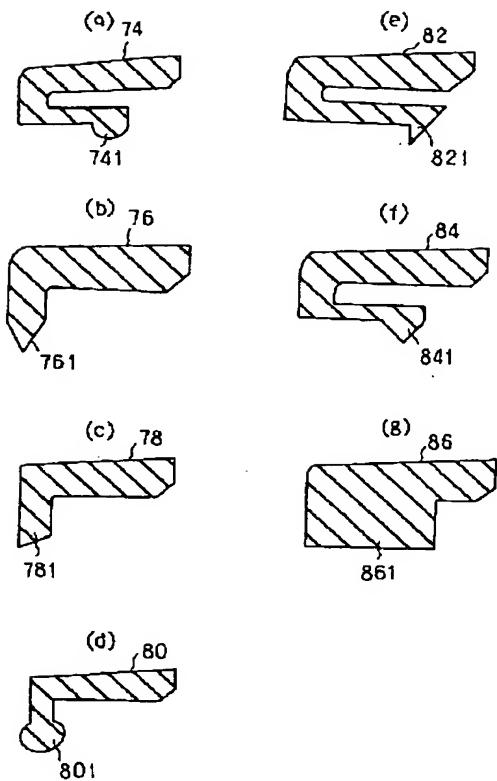
## [Drawing 2]



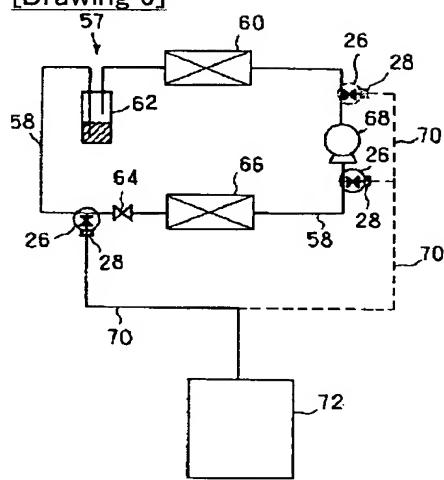
## [Drawing 3]



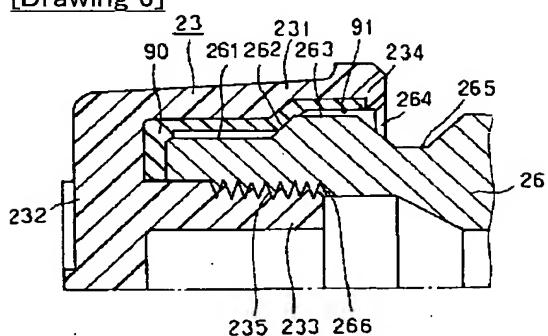
## [Drawing 4]



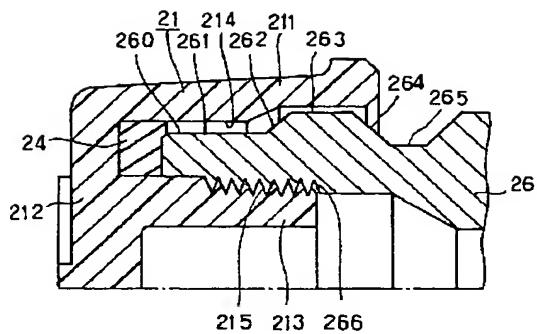
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]